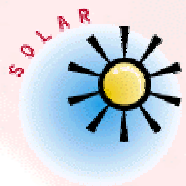
A Sustainable Future for South Texas

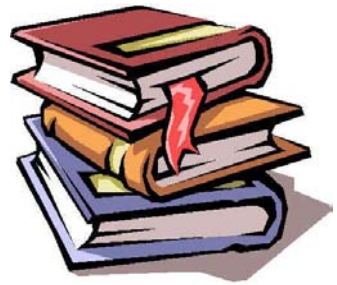


Solar San Antonio, Inc.

118 Broadway, Suite 635
San Antonio, TX 78205-1950
solarsa@swbell.net - www.solarsanantonio.org

Solar San Antonio **is a nonprofit 501(c)(3) advocacy and renewable energy resource center.**

Established in 1999, we have been active building relationships, educating policy makers, the general public and providing forums for discussions of alternative energy applications



Northside Independent School District Outdoor Classroom (Southwest Research Center)

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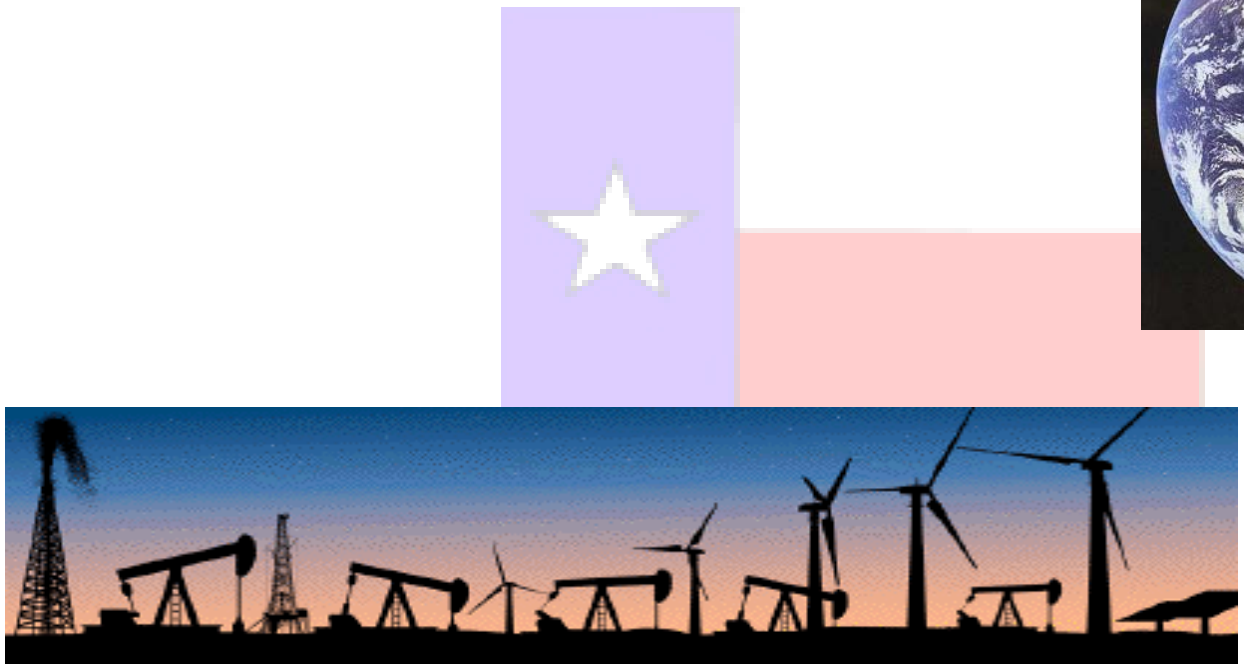
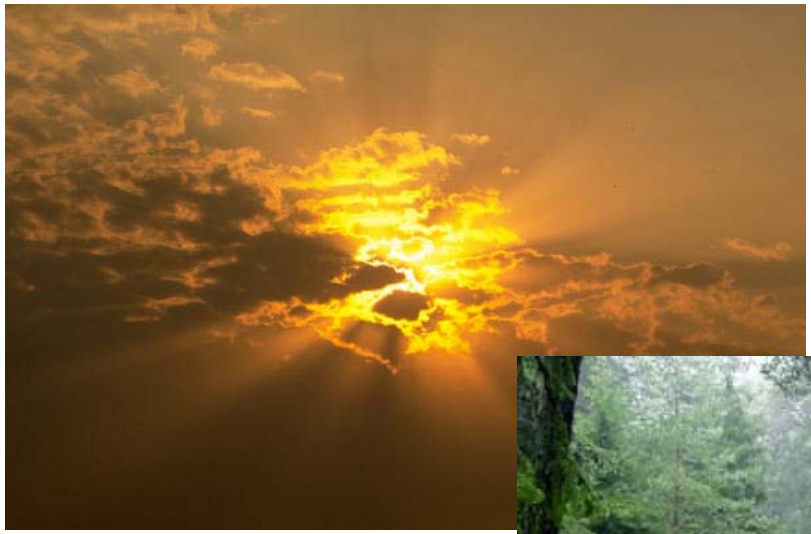
A historical perspective…





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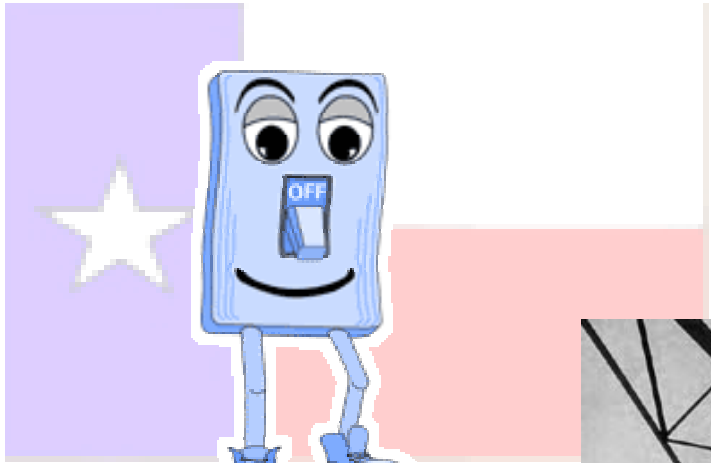

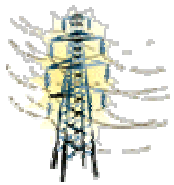

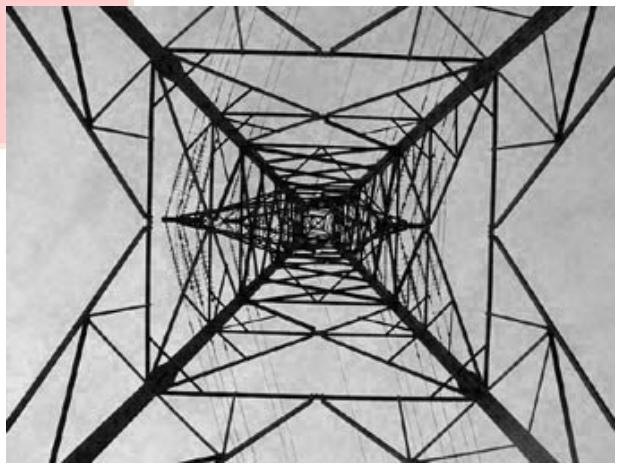

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ENERGY MATTERS

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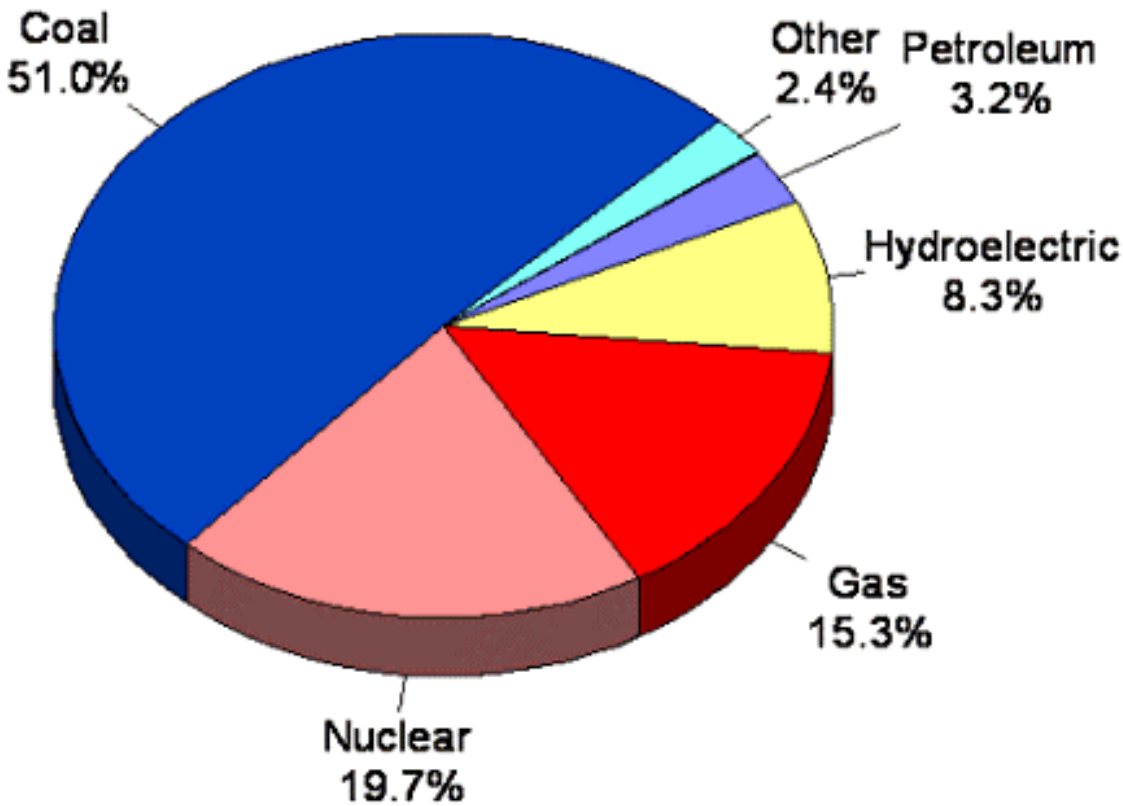
ENERGY MATTERS

Cars make most of San Antonio's air pollution

SOLAR San Antonio

ENERGY MATTERS

Industry Total = 3,691 Billion Kilowatthours



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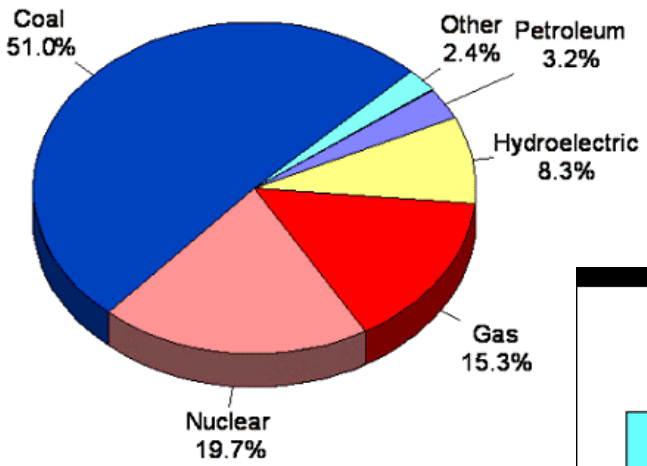
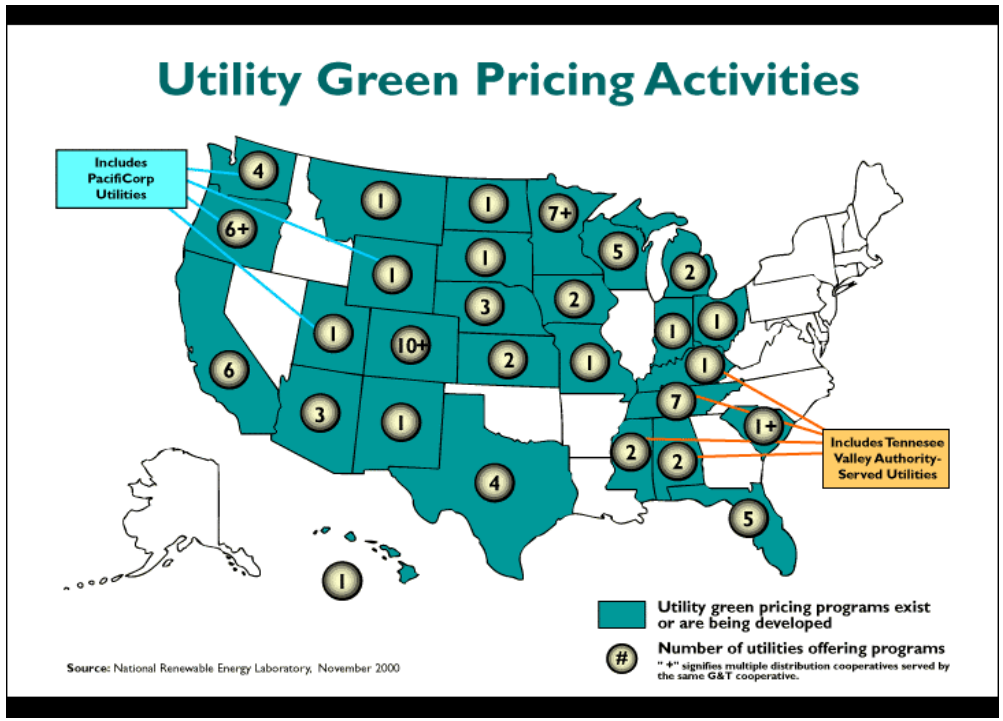
Industry Total = 3,691 Billion Kilowatthours

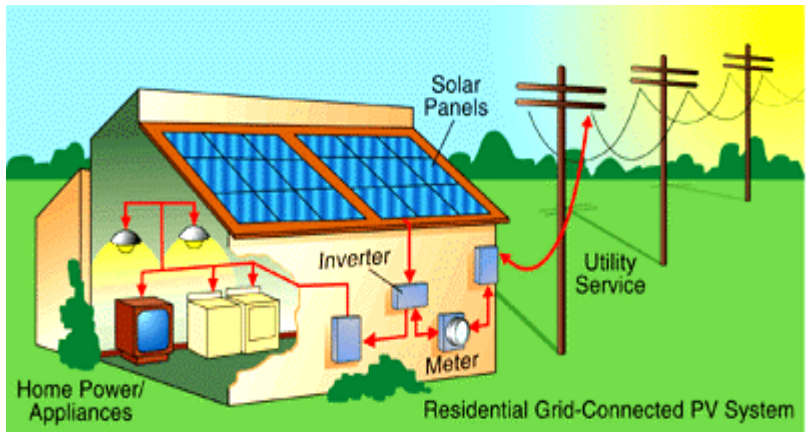




An average American home contributes 23,380 pounds of carbon dioxide into the air each year!

A solar hot water heater keeps 7,200 pounds of carbon dioxide out of the each year in use.

A 1.8kW PV system keeps 5,750 pounds of carbon dioxide out of the air each year.



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Bexar County Adult Detention Facility

San Antonio, Texas

The Bexar County Jail Annex uses a solar powered water heater. The annual operating cost is $2,600 compared to $76,000 for a conventional system.

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City Public Service
Northside Customer Service Center

SOLAR San Antonio

ENERGY MATTERS

With a solar thermal (hot water) system, the energy from the sun in the form of heat is transferred to the water in the copper tubing and stored for use in the hot water heater. This is FREE energy and saves money because no electricity or gas is used to heat the water.

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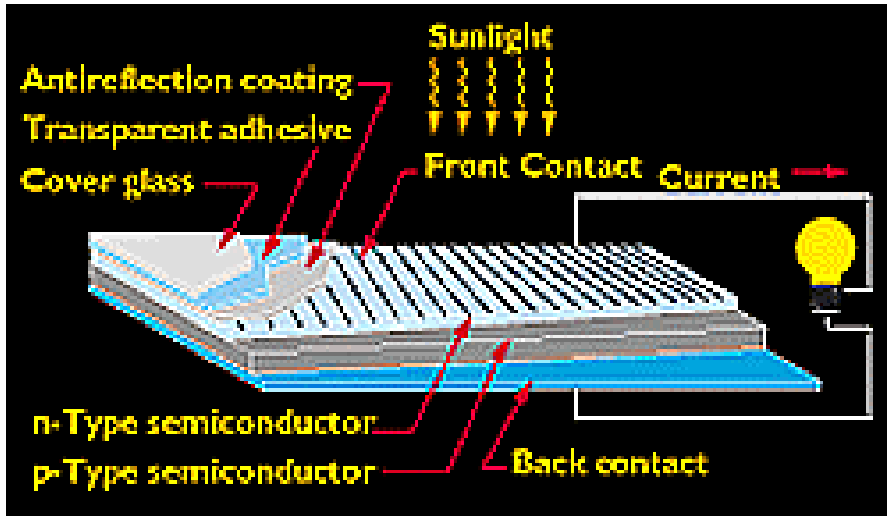

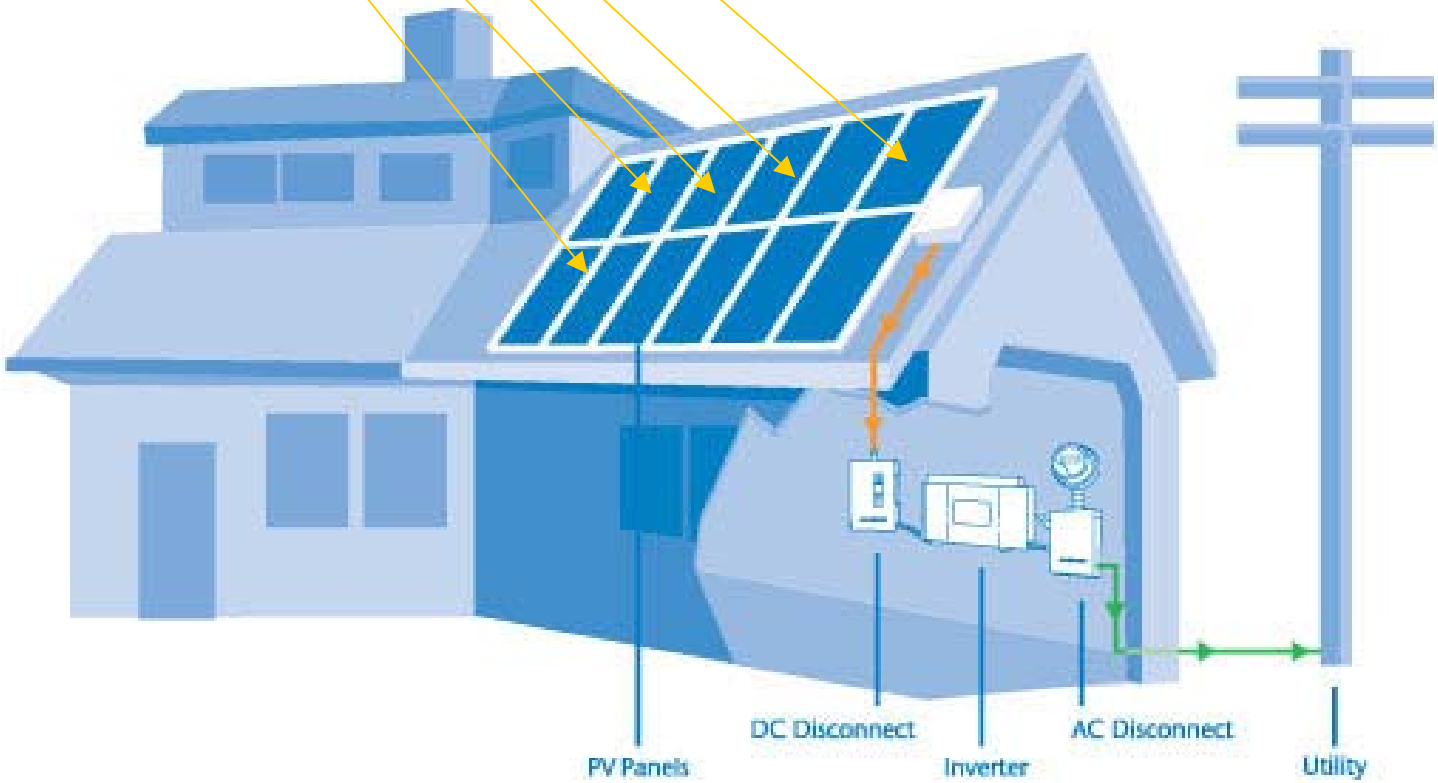

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Directly converting the sun's rays into a usable energy source called electricity, is accomplished through the use of "solar collectors," or more commonly called "solar panels."

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Solar cells are also called photovoltaic cells -- or PV cells for short -- were first developed in the 1950s for use on U.S. space satellites.

They are made of silicon, a special type of melted sand.

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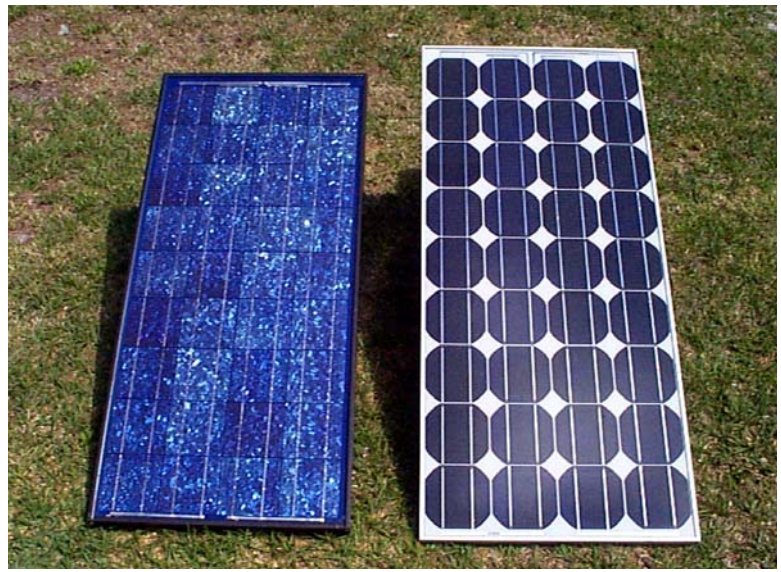
Photovoltaic Modules

A complete, environmentally protected unit consisting of solar cells, optics, and other components, exclusive of tracker, designed to generate dc power when expose to sunlight.
Most commercially available crystalline and multi-crystalline PV modules have 36 cells in series, and can be connected in series up to 600 volts DC.



60-watt poly-crystalline module

75-watt crystalline module

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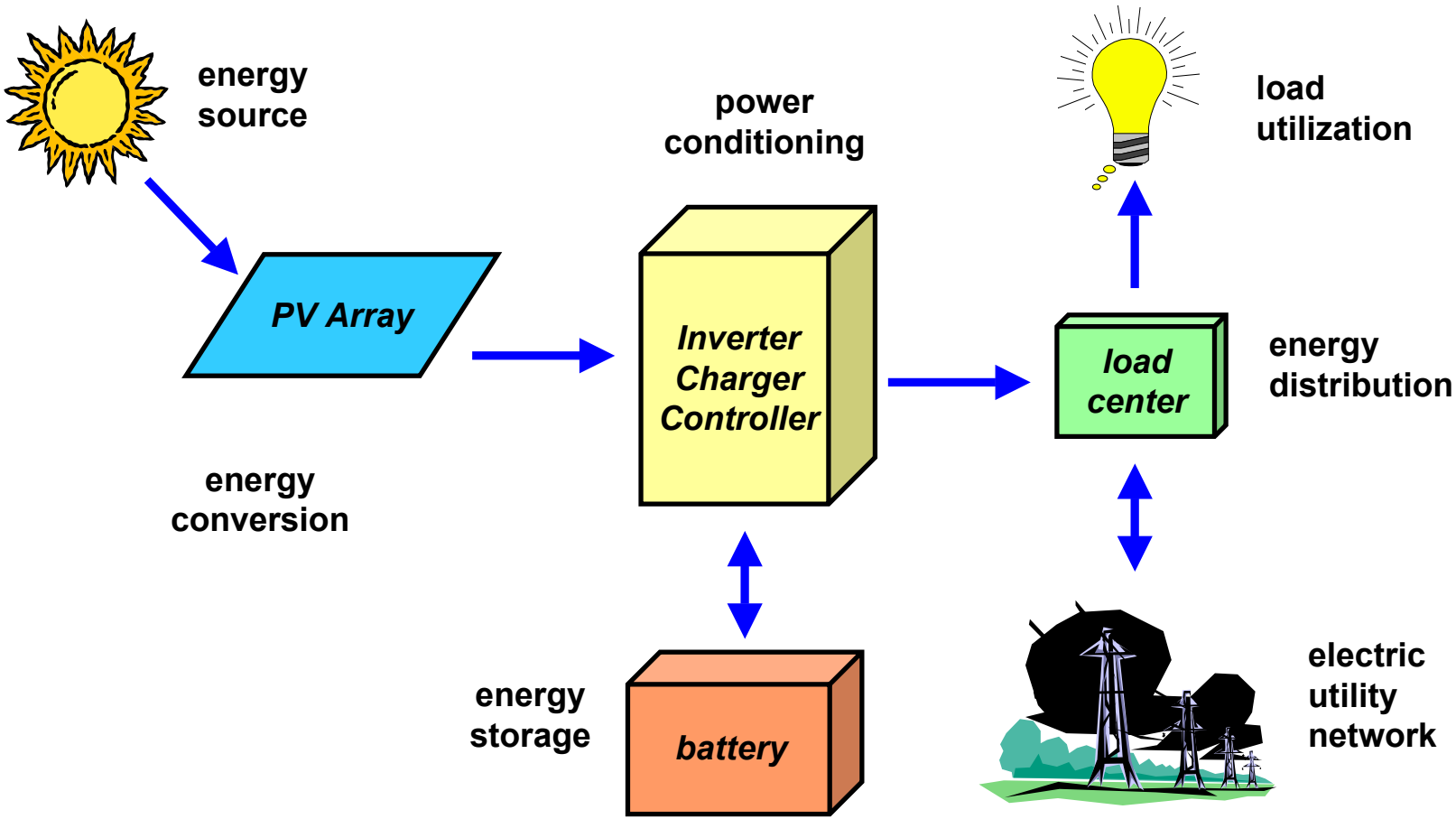
Solar Photovoltaic System



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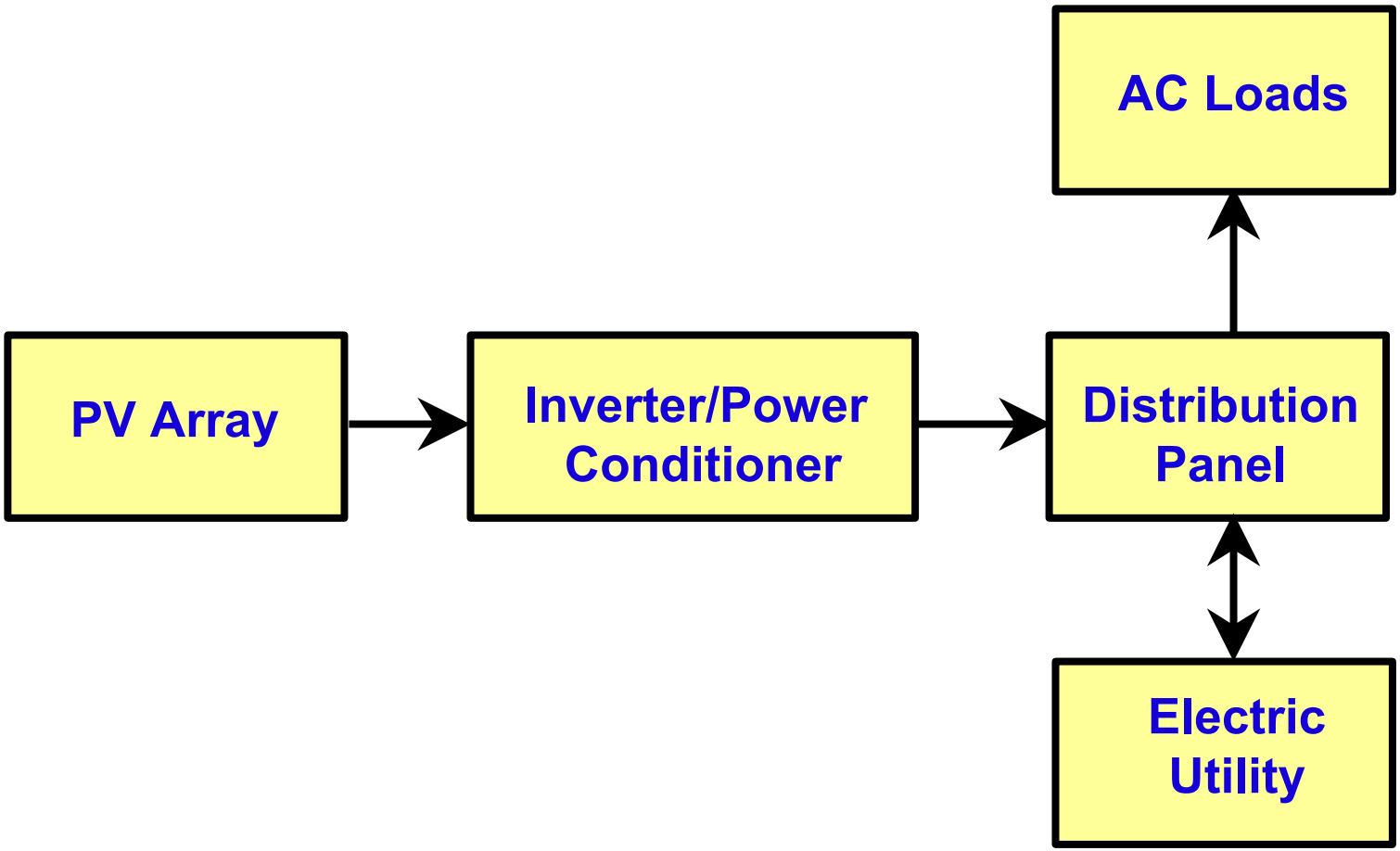
Utility-Interactive PV System (no energy storage)



* Arrows indicate directions of power flows

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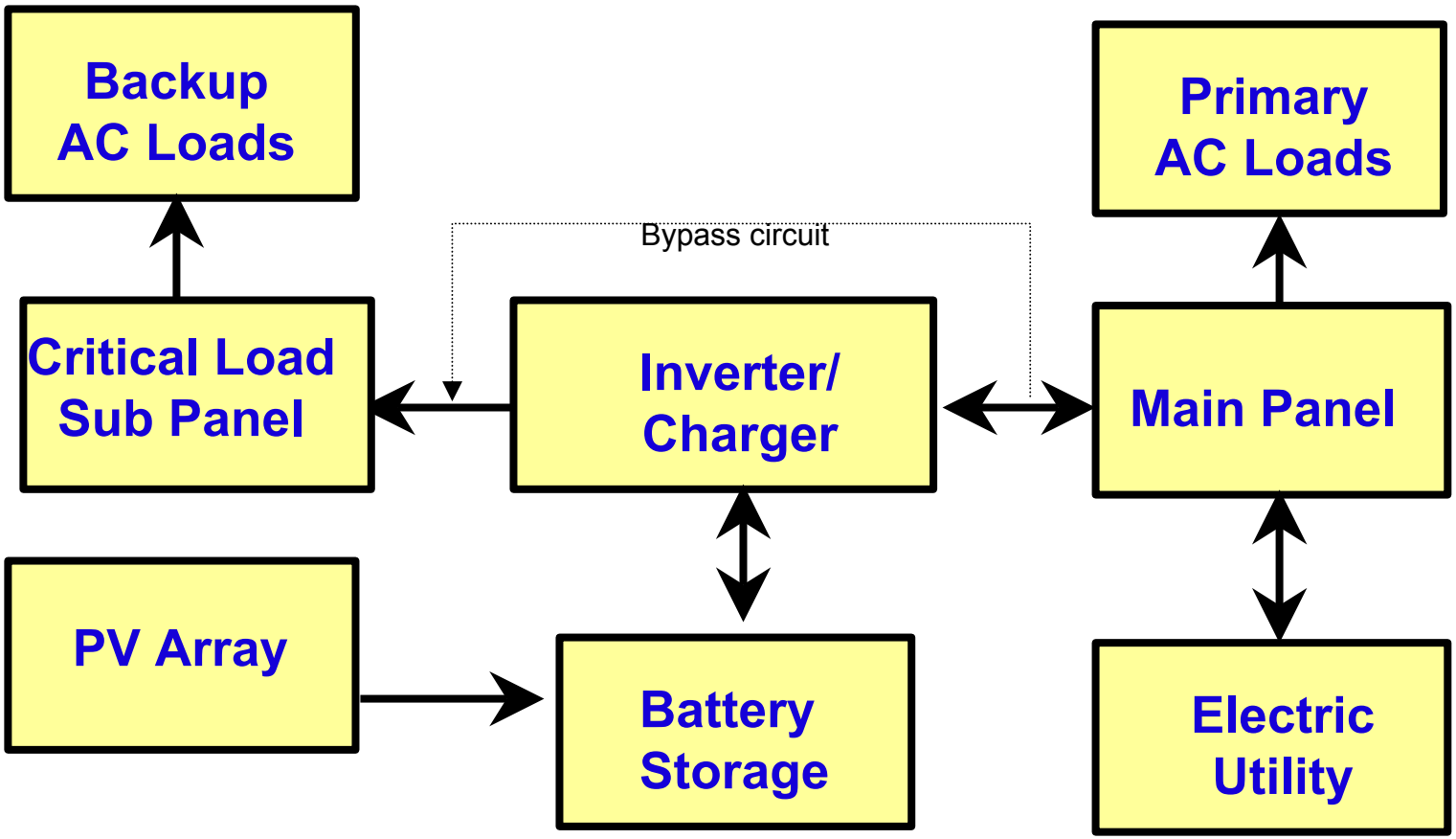
Utility-Interactive PV System with Battery Storage



* Arrows indicate directions of power flows

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Inverters for PV Systems

- **Inverter**

Equipment used to change voltage level or waveform (or both) of electrical energy from DC input to AC output. Inverters may also function as battery chargers that use alternating current from another source and convert it into direct current for charging batteries. Inverters for PV systems in sizes from 100 watts to custom designs of up to 1 MW or more. [Also known as a power processing unit (PCU) or power Conversion system (PCS).]

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Photovoltaic Arrays

A mechanical integrated assembly of modules or panels with a support structure and foundation, tracker, and other components as required, to form a direct-current power-producing unit.

San Antonio uses solar power in several ways-- housing projects using solar power, school traffic lights run on solar power as do some billboards around the city.

City Public Service (CPS) produces 4.2% of their energy from wind power!

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San Antonio is going to cut electricity use 5% each year for the next five years due to Senate Bill 5. One of the proposed methods of reducing energy consumption is to change all the traffic lights to LEDs. This style of bulb uses 80-90% less power. The reduced amount of elctricity used and maintenance schedule for replacements will add up to hundreds of thousands of dollars in savings.

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Solar Options for Various Building Needs

Technology	Electricity	Heat & Cool	Process Heat	Hot Water	Light
Photovoltaics	√√			√	
Geothermal Heat Pumps		√√		√	
Solar Thermal	√	√	to 750 F	√√	
Advanced Daylighting		√			√√

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Passive Solar Design – a whole-building, integrated approach to energy design minimizing loads and using standard elements of a building, such as windows, walls and floors, to collect, store and release the sun's energy for heating, cooling and lighting.

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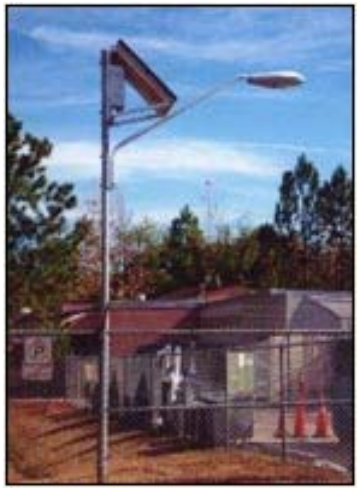

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Energy$mart Schools

A Campaign of Rebuild America
U.S. Department of Energy

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The Winston School, Dallas, Texas
PowerLight/Nuon/Green Mountain PV System

Source - NREL

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World's Largest PV Carport
Naval Base Coronado

"The photovoltaic system combines the environmental benefits of solar with the ability to provide on-site power that serves to reduce our vulnerability to disruptions of the power grid."

– Lt. Commander Wade Wilhelm

Navy Region Southwest Utilities Program Manager

SOLAR San Antonio

Naval Base Coronado PowerShade, San Diego

Produces 1.2 million kWh/year equivalent to 2,488 barrels of crude oil

Electric Charging Station

University of Southern Florida

Economic Potential

- **Texas, particularly San Antonio, is located at the crossroads to a future market for solar power.**

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Texas has Tremendous Solar Potential

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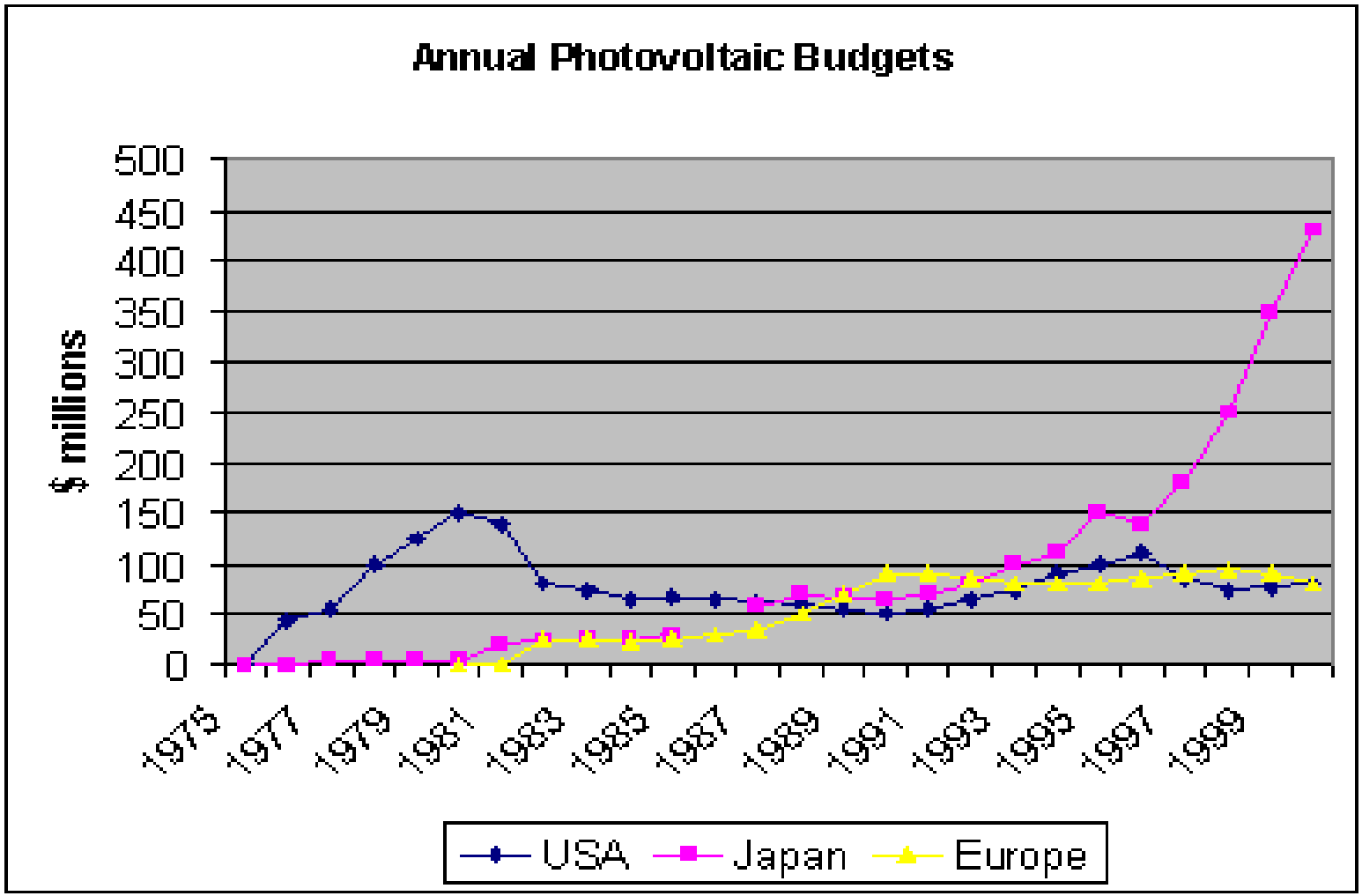
Japan-Germany Biggest PV Investors



Source: Solarbuzz

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Implications for Economic Development

- **Create new jobs in emerging Billion-Dollar Market**
- **Promote Energy Independence (if not for us, for our children)**
- **Price Stability – natural gas may continue on the rollercoaster of price variation**
- **Reduction in Air Pollutants – each small step brings us cleaner air**

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Implications for Economic Development

ACTION STEPS:

- **COSA/Bexar County commitment to Renewables @ _?_ % /year**
- **Increase CPS capacity by 1% per year of renewable generation**
- **Allot ¼ % of utility budget to renewables for rebates, projects, etc**
- **Residential/commercial properties use renewables and harvest green credits**

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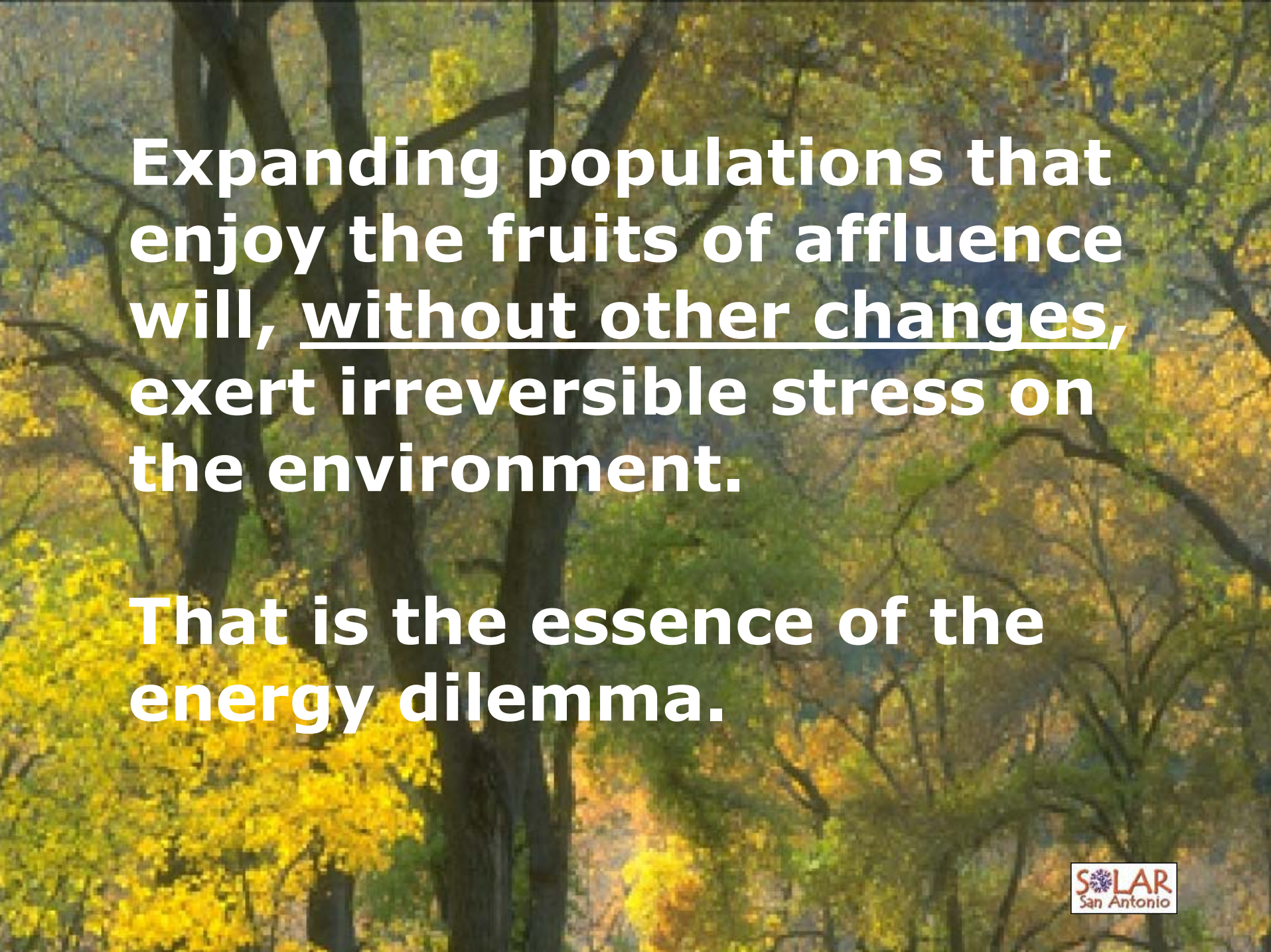

Expanding populations that enjoy the fruits of affluence will, without other changes, exert irreversible stress on the environment.
That is the essence of the energy dilemma.
SOLAR San Antonio

Think globally…

…act locally!!

What will *<u>you</u>* do in your lifetime to ensure a sustainable future?

SOLAR San Antonio

Solar San Antonio, Inc.

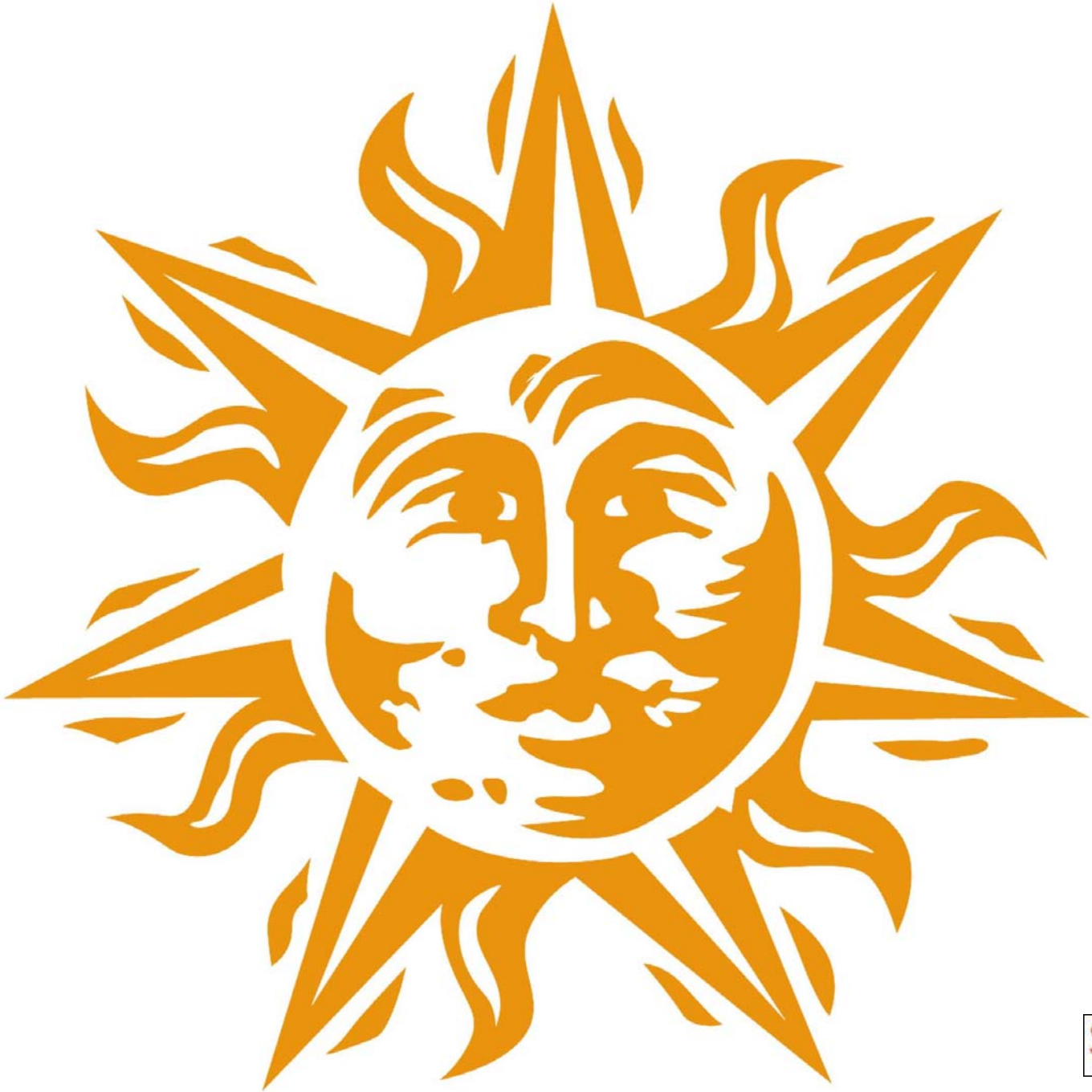
118 Broadway, Suite 635
San Antonio, TX 78205-1950

www.solarsanantonio.org

Email: solarsa@swbell.net

(210) 354-0236 – Voice
(210) 354-0200 – FAX

William R. Sinkin, Chairman
Dominick A. Dina, Executive Director



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